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Saalfeld[2] hold that external influences act first upon the cytoplasm (protoplasm) of the cells, and especially of the germ-cells, producing inceptive genes (plasmogenes) which finally become true genes of the heredity-chromatin when the long-continued strain has passed a certain "threshold." This final abrupt change would well account for the abrupt appearance of new characters in the ontogeny, or the salto-mutations of De Vries and the constancy of persistent types under stable external conditions. Likewise the fact that the cytoplasm is known to influence the heredity-chromatin of the nucleus, or the genes, would explain the absence of flucto-mutations or variations under stable conditions. Persistent types are then either forms in which through lack of external stimulation no changes arise in the cytoplasm that produce new genes; that is, forms in which the cytoplasm is not able to react any more to external influences and differentiation could take place only through loss of genes or a combinative mode of production of new genes. This latter method leads to so-called "self-differentiation" and thereby to the excessive terminal forms of series, or to terminal persistent types, in which latter case absolute rigidity of the forms would result from the entire failure of acquisition of new genes and gerontic rigidity in the old ones.

The persistent radicles, on the other hand, correspond to the extreme development of what Saalfeld, from his studies of ammonites, terms "Konservativreihen." These are series in which the salto-mutations appear in very long intervals, while the numerous side-branches (which furnish the index-fossils) develop by rapid salto-mutations. These persistent radicles are therefore able to undergo new periods of explosive and climacteric development (Virenz-perioden of Wedekind) and are thus still less absolutely persistent than the persistent terminals.

[1] Presidential address before The Palaeontological Society, Albany meeting 1916, *N. Y. State Mus., Bull.* **196,** 1918 (107–38).

[2] *Die Phylogenes Fragestellungen zu ihrer exakten Erforschung. Berlin. Gebr. Bornträger.* 1921.

NEW FORMS OF LIFE FROM THE SILURIAN

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The silurian of New York (Bertie waterlime and Lockport limestone) have recently yielded some extraordinary fossils which are now under investigation.

There are algae with well-preserved air-bladders, and primitive land-plants with thick coaly tissue. The graptolites, however, are the most striking: Dictyonemas, a foot and more in diameter, and varied types of the Inocaulis group. The latter possess thickly sheathed, glove-finger like basal tubes that served as anchors, with distal or upper extremities, confused masses of long, rigid or flexed thecae giving the part the appearance of a Medusa-head. By frequent division into bundles of thinner tubes, these thecae sometimes produce a still denser mass, in which the axis is a compound, spirally rising platform composed of broader thecae. In this respect the structure is identical in appearance with the graptolite genus Cactograptus.

Worms abound in certain beds of both the formations named, several entire individuals with distinct segmentation having been found, one clearly referable to Protoscolex.

Among the brachiopods a species of Lingula preserves the original concentric color-bands.

Most interesting among the cephalopods is a Hexameroceras, in which the sides of the slit leading to the hyponomic sinus are provided with interlocking teeth, serving for protection, as in the case of the narrow slit-like aperture of the living Cypraea and other gastropods. This and other observations made upon these Silurian cephalopods are significant as supporting the view lately advanced by Prell (*Centralblatt*, No. 10, 1921, pp. 303–315) that in the early nautiloids of the Phragmoceras and Gomphoceras types with variable and contracted apertures, the animals lacked all cartilaginous cephalic parts and were so plastic that they were able to squeeze their entire cephalopodium out; thus comparable to the recent Helix and Cypraea. The apertural sinuses which have served to distinguish the so-called genera Pentameroceras, Hexameroceras, etc., are therefore not as constant features as has been supposed, nor did they serve as exits for arms.